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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/792,245	03/03/2004	Yui Whei Chen-Yang	250325-1010	3978

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EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/792,245

Applicant(s)

CHEN-YANG ET AL.

Examiner

Katarzyna Wyrozewski

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3/3/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9, 13, 15-23, 26, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by ARTHUR (US 5,354,611).

The prior art of ARTHUR discloses dielectric composite comprising porous silica and fluorinated polymer.

Polymers: Polymers of ARTHUR are fluorinated polymers such as PTFE, HFP, TFE, PFAVE and the like, all listed in col. 2 of the specification.

Silica: Is porous silica having average particle density of 0.5-0.6 g/cm³. Average pore diameter is 40 angstroms, which is equivalent to 4 nm. Although ARTHUR does not specifically indicates that the silica of the prior art is mesoporous, it is well know that such is determined by the pore size of the silica. Mesoporous silica has pore diameter of 1-50 nm. Therefore the silica of ARTHUR is mesoporous silica.

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Modifying agent: the surface of the silica of ARTHUR is modified with hydrophobic agents, such as phenyl trimethoxysilanes or trifluoropyltrimethoxysilane. The amount of the silica spheres is in a range of 20-70 parts by volume.

Composite properties: CTE of less than about 50 ppm/ $^{\circ}$ C, dielectric constant of less than about 2.5. Although the dissipation factor is not explicitly listed, it would be inherent property as it is directly proportional to the material utilized as well as the CTE and dielectric constant properties.

In the light of the above disclosure the prior art of ARTHUR anticipates claims rejected above.

3. Claims 1-4, 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by HARMER (US 5,824,622).

The examples of the prior art of HARMER disclose formation of composite from silica and fluorinated resin.

Example 1: 40% resin and 60% silica pore volume 0.38 cc/g with an average pore diameter of 5.59 nm.

Example 2: 40% resin and 60% silica pore volume 0.36 cc/g with an average pore diameter of 8.3 nm.

Example 3: 40% resin and 60% silica pore volume 0.30 cc/g with an average pore diameter of 3.5 nm.

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Although the above examples did not disclose modification of the silica such is fully taught and suggested in the specification of the prior art. Modifying compounds include trimethylmethoxysilane, phenyl trimethoxysilane and the like (col. 5). Such compounds would chemically bind to the silica of HARMER and thereby render it hydrophobic.

The properties of the composite are viewed as inherent since the same generic type polymer and filler are utilized and in the same amounts as required by the claims of the present invention.

In the light of the above disclosure, the prior art of HARMER anticipates requirements of claims rejected above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 10-13, 24, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over either ARTHUR (US 5,354,611) or HARMER (US 5,824,622) either one of which in view of FUJIWARA (US 2004/0213996).

The discussion of the disclosure of ARTHUR and HARMER from paragraphs 3 or 4 of this office action is incorporated here by reference.

The difference between the present invention and the disclosure of ARTHUR or FUJIWARA is recitation that the silica is hexagonal.

With respect to the above disclosure the prior art of FUJIWARA discloses mesoporous materials. Mesoporous hexagonal silica is that which has been made through precipitation instead of sol gel method.

Silicas formed by different methods give different crystal structure or lattice to the final product, however they still produce a silica having pores with pore diameter less than 1-50 nm.

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In the light of the above disclosure it would have been obvious to one of ordinary skill in the art at the time of the instant invention to utilize hexagonal silica, since the mesoporous hexagonal silica still contains the required pore size and therefore the properties of the composite are expected to be the same.

8. Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over either ARTHUR (US 5,354,611) or HARMER (US 5,824,622) either one of which in view of ANDO (JP 01133988 Abstract)

The discussion of the disclosure of ARTHUR and HARMER from paragraphs 3 or 4 of this office action is incorporated here by reference.

The difference between the present invention and the disclosure of ARTHUR or FUJIWARA is recitation that the silica is fibrous.

With respect to the above difference, the prior art of FUJIWARA discloses composite composition comprising porous silica whisker. Whisker is a fiber.

Using fibrous silica still allows for formation of the composite having porosity, which composite can withstand pressure and is strong.

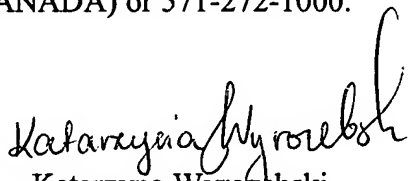
In the light of the above disclosure it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize mesoporous silica that is in shaped into fiber. The shape of the silica would not alter the pore size of the mesoporous silica and therefore it would be expected to yield a composite having the same properties.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski whose telephone number is (571) 272-1127. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Katarzyna Wyrozebski
Primary Examiner
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